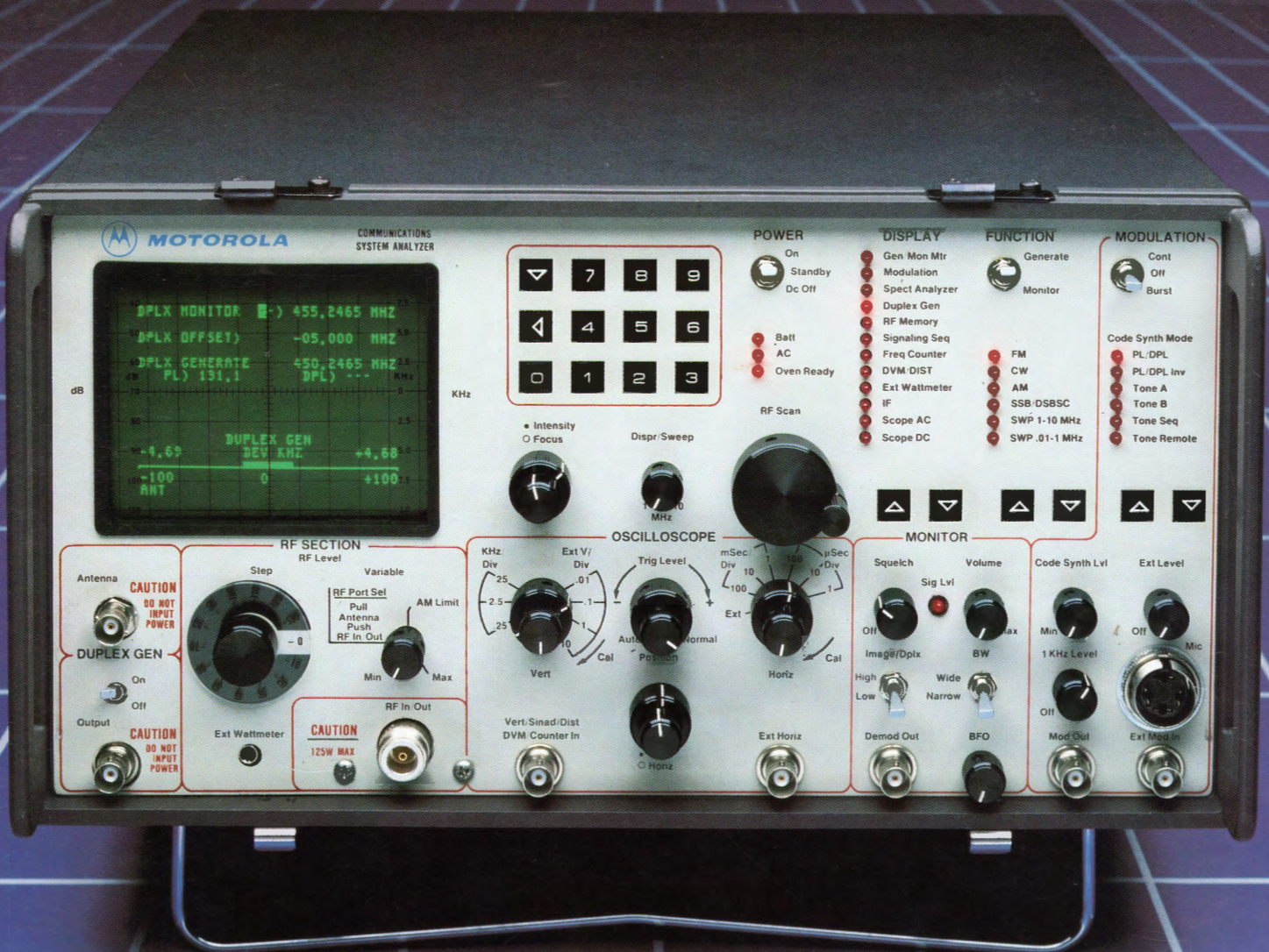


THE R-2001 D COMMUNICATIONS SYSTEM ANALYZER



COMMUNICATIONS SERVICING MAY NEVER BE THE SAME

The R-2001D Communications System Analyzer is a better investment. Whether test instrumentation with quality specifications or maximum field test capability is your bottom line, Motorola's R-2001D offers the best of both. Through use of the Motorola M6800 series microprocessor, a wide range of test instruments have been incorporated into a lightweight, field portable unit. Designed and manufactured by Motorola for your present and future business needs, the R-2001D is so unique, so advanced, communications servicing may never be the same. Simply said, the R-2001D Communications System Analyzer gives you superior test capability today and flexibility for future technologies.

MULTIPLE FUNCTIONS

The R-2001D Communications System Analyzer represents a tremendous consolidation in test instrumentation. An advanced selection of test equipment to support new and existing land mobile technology, the R-2001D can allow the technician to reach a higher quality and broader scope of repair. Precise and easy to operate, the R-2001D provides the facility to service most two-way communication products, citizens band transceivers, high frequency SSB equipment plus most types of AM, FM, SSB transmitters and receivers operating between 1 MHz and 1 GHz. Designed by a world leader in radio communications, the R-2001D performs the 16 testing functions of the following instruments:

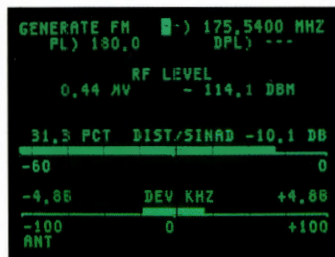
- | | |
|--------------------------------|--------------------------|
| ■ 1 GHz Signal Generator | ■ Frequency Error Meter |
| ■ Off-the-Air Monitor Receiver | ■ Signal Strength Meter |
| ■ Spectrum Analyzer | ■ AC/DC Voltmeter |
| ■ Duplex Offset Generator | ■ Sweep Generator |
| ■ Oscilloscope | ■ SINAD Meter |
| ■ Frequency Counter | ■ Distortion Meter |
| ■ Terminated Wattmeter | ■ VSWR Measurement Meter |
| ■ Modulation Analyzer | ■ Signalling Simulator |

EASY TO USE

In addition, the unit provides a selection of easy to use operator controlled features. Features such as SCAN LOCK, a 1 GHz "off the air" Counter, Analog Synthesizer Tuning, RF and Tone Memory Tables, and User Customized Operation provide for streamlined operation. A large 8 cm X 10 cm CRT which displays measurement data in autoranging analog and digital form, keyboard data entry, LED annunciators, and a clean, sleek front panel enhance technician productivity.

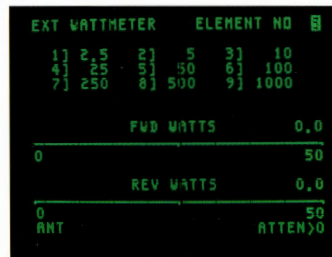
PORTABLE AND RUGGED

Weighing under 36 pounds, the R-2001D is at home in the field as on the bench. No stranger to the occasional bumps and bruises of field service, all elements of E.I.A. spec RS152B for shock and vibration are met. And the optional internal battery allows 1 hour continuous operation.



FM/AM/DSBSC GENERATOR

Notice the CRT display of the R-2001D. Frequency, RF level, squelch code, SINAD and deviation and shown with autoranging analog and digital readouts.



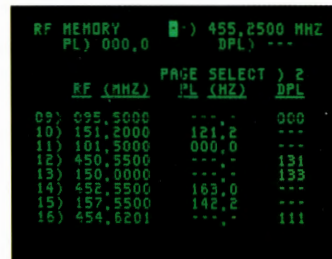
VSWR METER

The In-Line power measurement can eliminate the need to carry a separate wattmeter. VSWR measurements can be taken without taking the transmitter off the air.



FM/AM/SSB RECEIVER & SIGNAL STRENGTH METER

The advantages of a single, centralized CRT are very clear to see. All the data required is easy to locate and read.



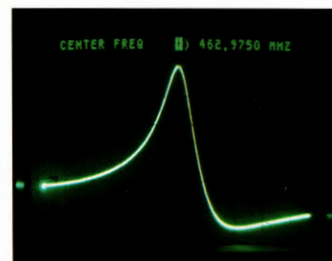
RF MEMORY TABLES

Often used frequencies can be stored in any of 32 memory locations along with PL or DPL codes for instant recall.



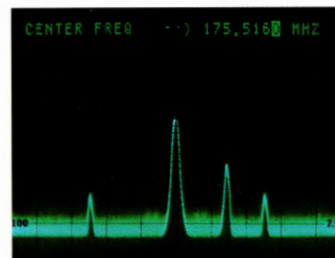
SCAN LOCK COUNTER

Simulating the 1 GHz counter, SCAN LOCK automatically SCANS, locates and LOCKs on the desired carrier. The 1 GHz counter is now obsolete.



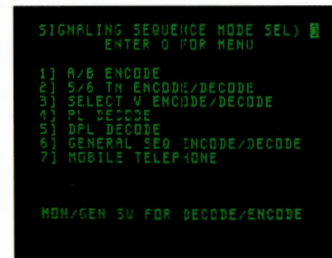
SWEEP GENERATOR

Measure bandpass characteristics for indepth troubleshooting/alignments of IF amplifiers, filters and FM demodulators.



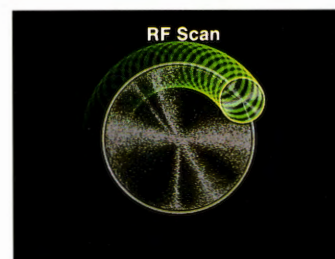
SPECTRUM ANALYZER

Visualize a window of RF spectrum with the added feature of a digital readout of the center frequency.



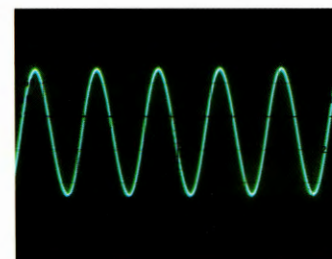
SIGNALLING SIMULATOR

Reach a broader range of service applications with a unique encode and decode capability. The signalling simulator can perform a complete system checkout for PL, DPL, car telephone and many other signalling formats.



ANALOG SYNTHESIZER TUNING

The rotary "spinner" knob can retune, rock or sweep a range of RF spectrum with the feel of an analog control but with the accuracy of a synthesizer.



OSCILLOSCOPE

Performs all the functions of a quality 500 kHz oscilloscope. Allows detection of assymetric modulation and audio distortion through waveform analysis.



DUPLEX OFFSETS

The offset generator eliminates all manual tuning adjustments. Simply enter the frequency from the keyboard.



TERMINATED WATTMETER

Key any transmitter, up to 125W of RF power, directly into your R-2001D. Auto-electronic activation of the full spectrum Wattmeter protects your unit for 60 seconds.

SUPERIOR TESTING CAPABILITIES



**AVAILABLE NOW FOR
THE SERVICING PROFESSIONAL...**



Field retrofittable software revisions

The R-2008D offers a range of automated cellular transceiver testing operations including Cell and Mobile initiated call simulations, multiple handoff and power level commands, SAT and DTMF measurements and manual test functions per the EIA defined 43 tests. Nonstandard test applications are

```

TONE MEMORY          MODE SEL.) 5
1) A/B SEQ          3) MOBILE TEL
2) 5/6 TONE         4) SELECT V
                    5) CELLULAR
CELLULAR             SEQ SEL.) 0
1) INITIAL PARAMETERS
2) SEQ TEST, CELL INITIATED
3) SEQ TEST, MOBILE INITIATED
4) MANUAL TEST MODE
5) AUTO-TEST MODE

```

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MOBILE INIT SEQ TEST      SEL) 1
1) ABRDT
2) TEMPORARY EXIT

  TL  0  1  2  3  4  5  6  7  8  9
  0  1  2  3  4  5  6  7  8  9

CHAN 3) 525  PL) 0  SAT) 2
MH 312-576-5444  SN 82000208
TEL NO      1-602-555-1212

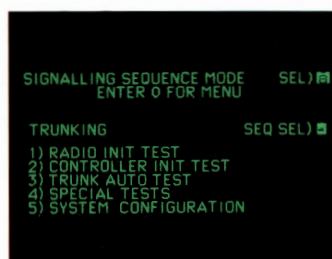
ERR KHZ      PUR M      MOD KHZ
+ 0.48      2.78      2.28

```

Our "thermometer" style display tracks the calling process and critical measurement data.

A better method to service Motorola trunked radio products, this option assembly for the R-2001D Communications System Analyzer makes possible comprehensive "closed cover" testing. Beginning with confidence testing, this system level tester allows for final installation/operation verification, essential for proper installation and follow up service. Under actual operating conditions test key transceiver and signalling parameters to insure system compatibility. Without disassembly, read fleet, subfleet, and unit ID directly from the unit under test. Verify transmitter power, frequency error, modulation and receiver tests quickly and easily. A built-in semi-automated test mode can provide a printout of multichannel test results. This allows for performance record keeping and proof of repair.

Never again will the lack of a Motorola trunked signalling simulator be a problem. The R-2001D Trunked Signalling option reduces dependence on cryptic built-in radio self tests and preserves valuable system air-time for customer use. New system features such as telephone interconnect, dynamic regrouping, and reading of code plug assignments can be incorporated through field installable software revisions. The trunked option board can be retrofitted for existing R-2001D Communication System Analyzers.



Main menu for selection of Trunked Radio test screens.

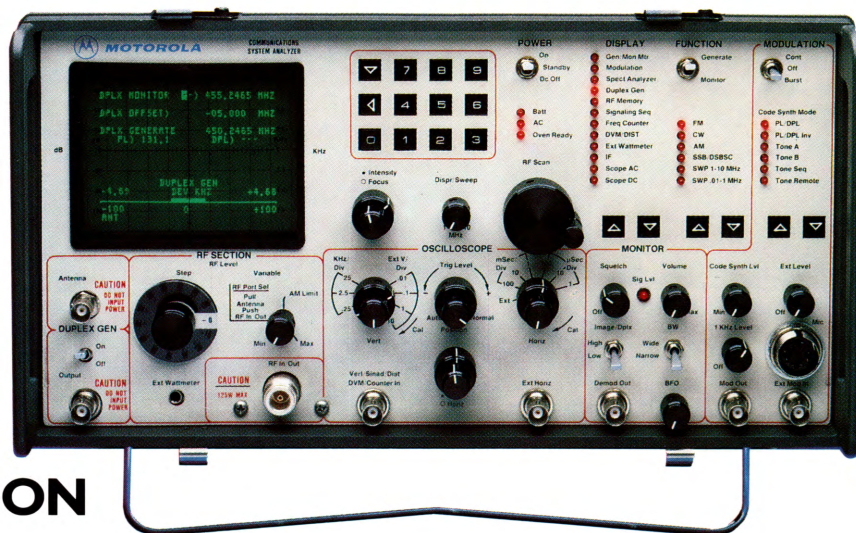


Trunked Radio initiated test screen. Signalling events 1 through 7 completed, with radio on voice channel. ID information has been decoded and displayed along with radio's frequency, power and deviation.



$$\text{Savings per month} = \text{Time saved per radio} \times \text{Loaded cost of technician/hour} \times \text{Number of radios tested/month.}$$

SECURE VOICE COMMUNICATION TESTING



FUTURE EXPANSION CAPABILITY

As the communication needs of the land mobile industry grow, so to will the capability of the R-2001D. Whether your primary area of expertise lies within the traditional two-way radio product area, paging markets, mobile and car telephone systems or other new technologies, the R-2001D is the right choice. For example, secure communication systems are expanding to an ever growing number of users. And once again, Motorola maintains the leadership position with test capability for Motorola DES (Data Encryption Standard) and DVP (Digital Voice Privacy).

Available as a PC board assembly, this option provides for improved deviation measurements, a critical parameter in secure communication systems. To gain needed accuracy for the wideband nature of digitally encrypted systems, special CRT displays provide relative deviation error measurements. The R-2001D's integral oscilloscope display becomes especially useful to insure exact specifications are met. Trouble shooting bandwidth and distortion of a data path or adjusting the data sensitivity of a receiver, are made possible with Bit Error Rate measurements.

Developing a unique expertise in signalling capability, test capability for secure voice communications, without the need for a specialized test set, is one more example of the power of the R-2001D.

The R-2001D's microprocessor and modular construction are designed for future expansion so that test capability can be added as new system test requirements develop. All the options presented here can be retrofitted into the R-2001D Communications System Analyzer. In most cases, software upgrades and option expansions can be performed in the field. Simultaneous multi-option capability allows the owner to support new technologies as they develop. New products and technology advances can reduce the effectiveness of your test equipment making product obsolescence a major concern. Motorola, a market leader in innovation, understands this concern and has designed the R-2001D to accommodate future system test requirements.

To see for yourself all the new system test features of the R-2001D Communications System Analyzer, call and arrange for a demonstration.

1-800-367-2346, ext. 36

NOTE: Shipments outside U.S. require munitions license.



MOTOROLA

GENERAL SPECIFICATIONS

Power and Environment: AC: 100-130 VAC, 200-260 VAC, 47-63, 400 Hz DC: +11.5 VDC to +16 VDC

Optional Battery: 13.6 V Battery—provides 1 hour continuous operation

Temperature Range: 0° to +55°C operating, -40° to +85°C storage

Dimensions: 8.25 in high x 15.50 in wide x 20.00 in deep (21 cm x 39.4 cm x 50.8 cm)

Weight: 35.5 pounds (basic model) excluding battery pack, cover & accessories (16.1 kg)

SIGNAL GENERATOR

Modes: AM, FM DSB, CW. **Frequency Range:** 10 KHz to 1 GHz. **Resolution:** 100 Hz. **RF Output:** 1 VRMS maximum. **Spurious Emission:** -40 dBc. **Harmonics:** -15 dBc.

MONITOR RECEIVER

Modes: AM, FM, SSB. **Frequency Range:** 1 MHz to 1 GHz. **Resolution:** 1 Hz max. **Sensitivity:** 1.5 μ V max. **Power Dissipation:** 125 Watts max.

SIGNAL STRENGTH METER

Range: 1 MHz to 1 GHz. **Sensitivity:** -100 dBm to +52 dBm.

SPECTRUM ANALYZER

Dynamic Range: 75 dB minimum. **Scan Width:** 1 MHz to 10 MHz variable. **Sensitivity:** -95 dBm minimum.

DUPLEX GENERATOR

Offset Range: 0 MHz to \pm 10 MHz and fixed \pm 45 MHz. **Accuracy:** \pm .002%. **Output Level:** -35 dBm @ 50 ohm.

SCAN LOCK "OFF-THE-AIR" FREQUENCY COUNTER

Frequency Range: 10 Hz to 35 MHz plus SCAN LOCK to 1 GHz. **Resolution:** 0.1 Hz max; \pm 1 kHz in SCAN LOCK. **Acquisition Time:** 1 sec typical (limited scan).

SIGNALLING SIMULATOR

Encode and Decode Functions: PL, DPL, 2 Tone, 5/6 Tone, Select 5, Mobile Telephone, 10 Tone Sequential Optional Cellular and Motorola Trunking. **Frequency Range:** 5 Hz to 20 KHz encode, 50 Hz to 10 KHz decode. **Resolution:** 0.1 Hz.

TIME BASE

Standard TCXO

Temperature: $\pm 1 \times 10^{-6}$
Aging: $\pm 1 \times 10^{-6}$

Optional OCXO

Temperature: $\pm .05 \times 10^{-6}$
Aging: $\pm 1 \times 10^{-6}$

See detailed specification sheet R3-9-51 for precise specifications.

Model Nomenclature:

R-2001D	Basic Model
R-2002D	Equipped with IEEE-488 Interface option
R-2004D	Equipped with voice secure service option
R-2008D	Equipped with U.S. cellular service option
R-2010D	Equipped with TACS cellular service option
R-2021D	Equipped with trunking service option

*Note: High stability and 220 VAC models available.
Any 2 options can be ordered in a single unit.*

Support Services

The modular design of Motorola test equipment allows for field repair in many instances should a problem occur. For service on your Motorola test equipment in the US contact the Motorola Test Equipment Service Center East, 1313 E. Algonquin Road, Schaumburg Illinois 60196 or call the test equipment hotline 1-800-323-6967. In Western U.S. contact Test Equipment Service Center West, 2333 B. Utah Avenue, El Segundo, Ca. 90245 or call (213) 536-0784. Outside the U.S. contact your nearest Motorola representative.



MOTOROLA

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